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Charles W. Grim, DDS, MHSA
Director, IHS
Keith Longie, CIO
Kenneth R Russell, Acting Director
ITSC
Juan Torrez, Editor

Information Technology News

DIR/Information Technology Support Center

Looking Forward to a New Year

In my first quarter as the new IHS Chief Information Officer, I was pleased to see the number of excellent products that we have available to our customers. This is a credit to the outstanding work of the IT professionals who work for the IHS. In my travels throughout the IHS, I have seen a great deal of excitement for the next generation of products we will be offering. It is our goal to provide the highest quality IT resources possible to the IHS. In order to accomplish this goal, I have set out our priorities for 2004:

- Development of the IHS Electronic Health Record (EHR)
- Development of the Patient Account Management System (PAMS)
- Further expansion and improvement of the Executive Information Support System (EISS)
- Support and integration of HIPAA Transaction and Code sets
- HIPAA Security
- Data Warehouse
- Improvement of IHS Telecommunications
- Improved training for both our customers and our staff.

Two big goals for 2004 are to pro-



vide the IHS with state-of-the-art IT products and to help our customers use these products well. We will need to expand our training efforts to provide increased training to our customers on the software products we currently offer and also provide training to our IT professionals so that they can stay current in their fields and expand their knowledge to new areas where we are rapidly progressing. It will be an exiting year, hang on!

Capt. Keith Longie
Chief Information Officer

Capt. Keith C. Longie was appointed the new Chief Information Officer (CIO) and Director of Division of Information Resources (DIR) in July of 2003.

Application Development News

The IHS Electronic Health Record Project Update

There continues to be a lot of activity around the development of the IHS Electronic Health Record. This update is current as of the week of November 17, and further updates will be provided as needed.

The EHR effort has graduated from Project status (focused on development of the EHR product) to Program status (more broadly concerned with all aspects of training and implementation in the field after the product is completed). The EHR Program reports to the IHS Executive Leadership Group (ELG) through the IHS Chief Information Officer (Mr. Keith Longie) and the IHS Acting Chief Medical Officer (Dr. Vince Berkley). This acknowledges that EHR represents a true integration of information systems and clinical practice. It also reflects the high priority and the high expectations that have been placed on the program by IHS leadership.

IHS Director Charles Grim announced to the Information Systems Advisory Committee (ISAC) in September that IHS is committed to implementing the Electronic Health Record in twenty sites by the end of FY 2004. This challenging timeframe has moved all elements of the Program into high gear as we seek to comply with Dr. Grim's directive.

The Director has also engaged the twelve IHS Area Directors in a national EHR implementation plan. In a memo dated November 5, he requested that all Areas submit two sites as candidates for early EHR implementation during 2004. It will be the responsibility of EHR Program staff over the next few weeks to contact each of the nominated facilities, evaluate their interest and readiness, and finalize a listing of the "20 in '04" sites. We expect that

many facilities will be anxious to implement this technology as soon as it becomes available, and we will do our best to meet the demand.

Version 1 of the IHS-EHR will be installed at three alpha test sites (Tuba City AZ, Crow MT, and Wind River WY) early in 2004. Four or five beta test sites (selected from the "20 in '04" list) will go live in subsequent weeks. Once testing and certification of the EHR is complete, a tiered rollout to the remaining selected facilities will be planned.

The IHS-EHR web pages (<http://www.ihs.gov/cio/ehr>) have recently been updated to include screen shots of the EHR application running at Crow Hospital. Additional updates are planned, so readers are encouraged to check the website frequently for further information.

*Howard Hays, MD, MSPH,
IHS-EHR Clinical Lead*

Recent RPMS Application Releases

- Accounts Receivable v1.7 patch 3
- Admin. Resource Mgmt. System v2.1 patch 7
- Area Data Consolidation Export v1.0 patch 2
- Behavioral Health v3.0 patch 1
- Community Health Rep v1.0 patch 15



- GPRA Reporting System v2.1
- ICD-9 Updates v04.1
- IHS Dictionaries-Patient v99.1 patch 11
- IHS Dictionaries-Pointers v98.1
- Laboratory System v5.2 patch 17
- Outpatient Pharmacy v6.0 patch 05
- Pharmacy Patient Drug Education v6.1 patch 14
- Pharmacy Point of Sale Class II v1.0 patch 7
- Pharmacy Price listing v6.1 patch 41
- Pharmacy Price listing v6.1 patch 42
- IHS Table Update v4.1 patch 01

Albert Toya, Quality Assurance

Security News

Blaster/Welchia Worm Infections

As many of you well know, the Blaster worm and its variants recently infected the IHS computer and network systems. The effects of these worms, in many cases, left our systems and networks severely disabled. Continuing efforts to clean these infections have spanned nearly three months and required countless man-hours of often frustrating work. The impact on our ability to perform our daily functions cannot be accurately assessed, though most would agree that our productivity has at times been drastically reduced. Figure 1 shows a partial sampling of the Blaster and Welchia activity, expressed in number of probes per day, with a peak of over 3 million probes on August 26, 2003. Given the sample size that Figure 1 represents, it is reasonable to say that IHS experienced a total peak in excess of 10 million probes on a single day.

What are malicious programs?

There are three basic categories of malicious programs: Viruses, worms and Trojan Horse programs. Viruses, worms and Trojan Horses are all related to each other in various ways. Simple definitions are as follows:

Virus: A virus is a small program or application that was written with the primary intent of destroying or modifying data on a single computer. A virus will also seek to replicate itself on a single system, though typically cannot leave that

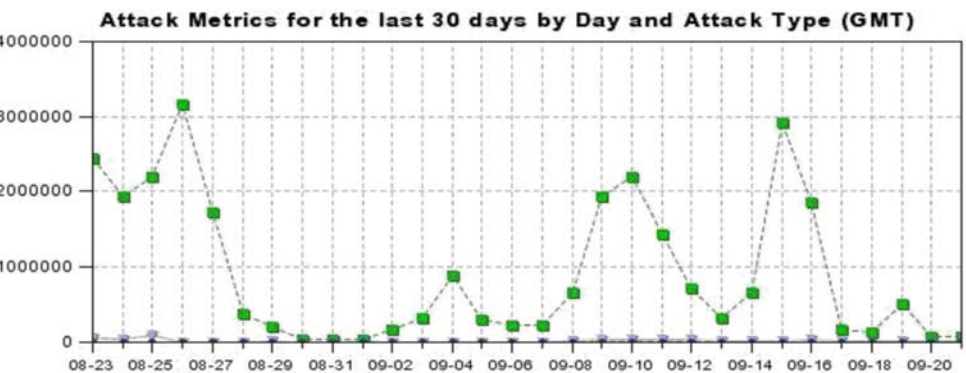


Figure 1: Blaster/Welchia Activity

environment without human intervention (floppy disks, emailing attachments, etc).

Worm: A worm is similar to a virus, though the primary purpose is replication. A worm may destroy or modify data, but the true purpose is to spread itself through any means possible, with or without human intervention (email, network shares, file-sharing applications, chat programs, etc).

Trojan Horse: Trojan Horse applications are programs that appear to be valid and benign, but typically destroy or modify data upon execution. Trojan Horses do not actively replicate themselves, but often rely upon social engineering in order to spread.

The lines between a virus, worm, or Trojan Horse are not always well defined. Nearly all of the modern malicious programs exhibit some behavior that falls into all three categories. There are other types of malicious programs, such as backdoor administration programs and

‘spyware’, though these programs are usually distributed as part of a worm or virus infection.

Where do they come from?

Viruses, worms, and Trojan Horse programs are written by programmers, just like any other program. The motivation for writing malicious programs varies from author to author, but typically involves getting attention or revenge. In the early days of computing, a virus writer was considered to be a very skilled, if misguided, person and their reasons for writing such programs tended to be personal in nature. Infections typically were small in number and well contained. Today, such people still exist, but their programs are often plagiarized by less skilled individuals who employ ‘virus toolkits’ to modify, enhance, and distribute their own malicious programs, usually seeking recognition from their peers. This was the case in the Blaster worm and its variants. When the Blaster worm was released, others quickly

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Behavioral Health System

Project Update

With the widespread deployment of the Behavioral Health System (BHS) v3.0 in January 2003 and the earlier release of MH/SS v2.0, the Behavioral Health program is at the forefront of the IHS's movement toward the use of computer-based patient records. There are now over 120 I/T/U sites using the behavioral health application.

The ITSC demonstrated the BHS v3.0 and a prototype of the Behavioral Health graphical user interface (BH GUI) application at several urban and IHS annual meetings this year including the IHS Annual Four Councils meeting, the annual IHS Division of Behavioral Health (DBH) meeting and two annual National Council of Urban Indian Health meetings. Many of the new users of BHS v3.0 are providers at tribal and urban sites. The application is in use at a diverse range of sites, such as a youth alcohol and substance abuse residential treatment center in South Dakota, an IHS-direct mental health program in Chinle, Arizona,, and an urban outpatient behavioral health program in Jamaica Plains, Massachusetts.



Functionality

BHS v3.0 combines select functionality and data elements from the earlier behavioral health applications—MH/SS v2.0, the Navajo version of MH/SS, and CDMIS. With BHS v3.0, providers can document clinical care, record program activities, and generate a wide variety of reports. The addition of a new suicide surveillance tool allows programs, Area offices, and the Division of Behavioral Health to record and track the occurrence of suicide attempts and completions. Suicide statistics and other behavioral health clinical data exported by sites will become part of a new web-based behavioral health data mart developed by the NPIRS team.

Usability and Design

Direct provider entry of clinical information is encouraged when using the BH applications. Direct provider entry improves the accuracy of clinical notes, reduces errors, and helps protect patient confidentiality. However, the BH applications will continue to support the entry of clinical data by data entry and other support staff. Most I/T/U behavioral health programs continue to use a hybrid system of computerized patient records and paper-based patient records. Improved technology allowing the integration of original documents and correspondence (signed releases, discharge summaries, and/or consultation reports from outside facilities, etc.) into the

patient's computerized record will help to achieve a truly comprehensive electronic medical record (EMR).

Perhaps more than improved technology, improved usability and design will most likely be the factors that make the provider give up the pen and chart for the keyboard and screen. It is hoped that a long-term behavioral health application, developed using GUI industry standards, user-centered design, and usability testing and analysis will encourage more providers to make the transition to an EMR. To this end, IHS contracted with Human Factors International (HFI), recognized experts in the field of GUI usability and design. HFI and the ITSC conducted extensive onsite end-user interviews and usability testing of preliminary BH user interface structures at four I/T/U behavioral health programs. In June, HFI provided a final usability analysis of the prototype BH GUI, final BH style sheets, and GUI standards.

BH GUI Beta Testing

The graphical user interface of BHS v3.0 was designed as a component within the IHS Patient Chart application. Beta testing of the BH GUI began on September 26, 2003 at the following I/T/U sites:

- Chinle Comprehensive Health Care Center
- Warm Springs Health Center
- Phoenix Indian Medical Center

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Self Determination Services Team

Who We Are and What We Do

Who we are

The Self-Determination Services team is a part of the Information Technology Support Center (ITSC) in Albuquerque New Mexico. We are a three person department that works closely with tribes, Urban programs, Area Lead Negotiators, IHS Area Office Information Technology staff, ITSC teams, and others relating to the subject of Tribal Self-Determination as it relates to Information Technology.

What we do

The Self-Determination team works in collaboration with P.L. 93-638 Self-Determination program managers throughout IHS in projects relating to the establishment of data systems and standards and requirements for tribal and urban organizations for submission of information to the National Patient Information Reporting System (NPIRS). In addition to this, the team also provides technical assistance in the design, standards, software, equipment, costs, evaluation, corrective actions, and scheduling relating to the establishment of data systems, workload, and statistical information requirements. We are focused on providing business support services to the Area Lead Negotiators, tribes, and Area offices in the way of share monitoring, service support, and resource identification.



Tribal Self-Determination

The IHS and tribal programs provide health services to approximately 1.5 million American Indians and Alaska Natives who belong to 556 federally recognized tribes in 35 states. There are currently 61 self-governance tribal compacts and 82 funding agreements representing 285 tribes, providing health services to over 51.1% of the American Indian and Alaska Native tribes. 44% of the Agency's budget of \$2.9 billion is transferred to tribes through funds referred to as tribal shares. Individual tribal shares are determined through a formula that has been determined to be equitable to all tribes. The Information Technology shares available to tribes as identified in the budget amounts to almost \$30 million. In addition, in 2004 there are 69 Title I (Contracting) tribes.

How are Tribal Shares identified and distributed?

The IHS Division of Information Resources (DIR) has produced an infrastructure document that categorizes the Information Technology functions and services that it has to offer along with associated shares (cost). The infrastructure document

serves as the basis for tribal selection and the amount of shared dollars that ultimately goes to the individual tribes and/or is retained by the IHS. The role of IHS is to serve as an advocate for tribal self-determination and to assist

tribes who wish to manage their own programs. The Self Determination Services team is serving as facilitators of the process and work with all parties involved to clarify the DIR activities.

What are Annual Funding Agreements?

The purpose of the Annual Funding Agreements is to encourage communication between the tribes and IHS on IT needs and resources to provide a customer focused support environment and to promote the interrelationship between Area and National program teams in service delivery to tribal customers.

What are we currently working on?

- Helping tribes achieve their self-determination initiatives in a responsible and results oriented manner. This includes, but not limited to, planning assistance, tribal share monitoring and resource identification
- Working in conjunction with the Office of Tribal Self-Governance and the Office of Tribal Programs

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Technology Management & Telecommunications

Technology Management & Telecommunications (TMT) consists of the following groups: Systems Support (supporting UNIX, AIX, NT, Windows 2000, Cache, and MSM mumps), Wide Area Network (supporting routers, security equipment-IDS/Firewalls, gateways, and IHS DNS services), Local Area Network (supporting Albuquerque ITSC/NP Local Area Network and office automation services including e-mail, active directory, and e-mail virus gateway protection), and Telecommunications (supporting FTS services ordering, tracking, processing, and cost accounting and audio/video conferencing).

IHS Windows 2000 Active Directory Update

The Department of Health and Human Services has directed all OPDIVs to move to an Enterprise Email system which utilizes Windows 2003 Active Directory and Exchange 2003. Since this event, IHS has made plans to upgrade the agency to Windows/Exchange 2003. Funding has been made available to those sites which have already upgraded to Windows/Exchange 2000. Those sites include ITSC, Headquarters, Phoenix Area Office, Navajo Area, Phoenix Indian Medical Center, and Oklahoma Area Office.

All remaining Areas are requested to halt any plans for migration and scheduled upgrades until after the ITSC office has been upgraded to Windows 2003 and Exchange 2003.

We have notified Dell Professional services to postpone current work and make amendments/change orders to reflect scheduling, licensing, and statement of work. Please contact Mr. Mark Vuong at Dell Professional Services if there are questions with contract details.

The ITSC plans to have the Windows 2003 contract in place by the beginning of December. The ITSC will undergo a two week testing process in December and perform upgrades to 2003 for previously migrated sites in January. Remaining agency upgrades will resume in February. We appreciate your cooperation and hope you will agree that the success of this project reflects upon the IHS as we are the model agency for the HHS Enterprise Migration.

Billing Issues

TMT has worked extensively with MCI and the USDA to eliminate a majority of the coding errors with the MCI billing system. One major issue was the inaccurate billing of telephone calls due to a number of PBX systems not sending the correct accounting data to MCI. TMT is currently obtaining cost estimates for upgrading the PBX systems so they correctly send data to MCI.

Viruses

The WAN group has been very busy blocking sites to prevent the spread of viruses. In addition, the WAN group has been working with the security team to implement the Intrusion Detection System (IDS) in Area offices.

New Routers

TMT has received the area 3745 routers and is in the process of shipping them to Areas.

HHSnet

The WAN group has been working closely with HHS to implement HHSnet, which will allow a higher speed, less costly network, meeting the every increasing needs of IHS health providers.

Conversions and Upgrades

The Systems Support group has been spread out across the IHS converting sites to Cache and upgrading AIX and NT sites to the most current versions.

Please contact Mr. Tom Fisher (505) 248-4219 or Ms. Karen Wade (505) 248-4254 if you have any questions regarding these activities

Web News

MORE Branches Out

The implementation of MORE (Mult-program On-line Recruitment Enterprise) for the Pharmacy program is complete and running on the production server. Implementation of MORE for both the Nursing and Dental programs web sites is currently under development. The Dental program implementation includes a revision to their existing Vacancy database.

Catherine Alleva
Web Developer

Kudos

Pamela Schweitzer, Pharm.D., has earned the designation of Board Certified Pharmacotherapy Specialist (BCPS) from the Board of Pharmaceutical Specialites. Congratulations Pam!

Indian Health Service Director's Award of 2003

CDR Sandra Lahi, RHIA, CPC

Commissioned Officer Awards

Outstanding Unit Citation

For ITSC Point-of-Sale Implementation

CDR Sandra Lahi, RHIA, CPC

CAPT Carlene McIntyre, Pharm.D.

CDR Pam Schweitzer, Pharm.D.

Field Medical Readiness Badge

CAPT Carlene McIntyre, Pharm.D.

Other ITSC Awards (contractors)

Catherine Alleva, Web Team (DC Special Team Award)



L.J. Baca, LAN/WAN (DC Special Team Award)

Lucas Covington, ITSC User Support (DC Special Team Award)

Jason Crim, ITSC User Support (DC Special Team Award)

Renita Curtis, project office (DC Cosmic Award)

Sue Ehrhart, NPIRS/Warehouse Team (DC Comet Award)

Tim Frazier, RPMS Developers Team (DC Saturn Award)

Morris Joe, ITSC User Support (DC Special Team Award)

Dan Largo, LAN/WAN (DC Special Team Award)

Danny Macias, Web Team (DC Special Team Award)

Jackie Mahoney, HQE Developer (DC Special Team Award)

Tom Mathues, LAN/WAN (DC Special Team Award)

Richard Payne, NPIRS/Data Warehouse (DC Special Team Award)

Walt Reisch, RPMS Developers (DC Special Team Award)

Shonda Render, RPMS Developers (DC Special Team Award)

Marsha Starr, RPMS Developers (DC Special Team Award)

Barbara Strzelczyk, NPIRS/Data Warehouse (DC Special Team Award)

Greg Thomas, User Support (DC Special Team Award)

Thank You Letters

Paul Getty

This letter was received via Robyn York, head of IHS Contracting and Director of the Division of Acquisition and Grants Management (DAGM), commending Paul Gettys for help he recently provided during the fiscal year turn. The letter was written by Pat Lee-McCoy, Director of the Division of Health Professions Support (DHPS) and Crystal Fergusson, Chief, Grants Mgmt. Branch, DAGM. Here is a paraphrased excerpt from the letter:

The Grants Management and Scholarship Branches hereby acknowledge the outstanding work and assistance Paul has provided these two programs during this past fiscal year. Prior to year end closing, Mr. Gettys met with our programs after the Division of Financial Management (DFM) notified us that \$1.4 million dollars in undelivered scholarship orders would be lost, if not disbursed by September 30, 2003.

Working directly in the database, Mr. Gettys had only 1 week to process

the appropriate funding dataset to the Program Support Center to insure that IHS did not lose the funding. Rather than the Grants Management or Scholarship personnel going through the documents manually, Mr. Gettys....worked to provide, from the database, the necessary datasets which contained over 2,000 records, to identify the awards and funding, to segregate the identified awards to be moved from one fiscal year to another, and to charge the current payroll against those

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Business Office News

The Patient Account Management System (PAMS)

Historically, the majority of I/T/U facilities have used the RPMS Third Party Billing (3PB) and Accounts Receivable (AR) applications to process paper and electronic claims to third party payers, including Medicaid, Medicare, and commercial insurance plans.

The 3PB application was initially developed to provide an electronic method of billing and tracking UB-92 claim forms submitted to Medicaid and Medicare at the all-inclusive rate. The benefit of using this billing application was that it provided a direct link with other RPMS applications such as Patient Registration, PCC, Laboratory, and Radiology. In 1994, I/T/U facilities were allowed to bill itemized charges to commercial payers. This paved the way for the 3PB application to capture the detailed charges that were required on the HCFA 1500 form.

In 1996, the AR application was developed to provide the I/T/U sites the ability to post payments and adjustments received from third party payers into each claim form created in the Third Party Billing package. The AR application has since been expanded with numerous tracking and reporting tools.

3PB and AR, although serving two different functions and providing two different types of data, have been developed to ensure their concurrent compatibility. But with I/T/U facilities becoming more involved in initiatives to bill for detailed items such

as tracking, reporting, and monitoring requests, there were increasing challenges in ensuring the data from both systems were in sequence. These challenges were not only in the enhancement of the software but also in the maintenance and support of the software at the national, Area, and facility levels.

In March 2003, the Chickasaw, Choctaw Nation of Oklahoma, and Gila River tribes met to discuss the billing needs of tribal facilities and the need to have an RPMS application that would not only provide an internal interface with the existing RPMS applications but also provide the functionality of a true patient account management system. These three tribes became recognized as the Tribal Consortium (TC). The TC met several more times with IHS and ITSC leadership to negotiate a strategic plan of merging the two applications into the proposed Patient Account Management System (PAMS) application. IHS supported the project and the PAMS project is now under design and development.

The first step in designing the PAMS application was to document existing functionality from both the 3PB and AR applications and then identifying new functionality that would improve the revenue generation process. With previous functionality identified by the TC, a meeting was held on August 2003 with the IHS 3PB/AR Technical Advisory Group (TAG) to define the existing func-

tionality of the 3PB, AR, Patient Registration, and Check-in applications. The final requirements were included in a proposal submitted by the Tribal Consortium to IHS.

In September, Informatix Laboratories Corporation was awarded the PAMS application development contract. The TC hired a project manager and meetings are being held to define the project plan, testing process, and software coordination. In December, a meeting is being scheduled with the IHS Patient Registration TAG to define the functionality requirements needed in Patient Registration version 7.1 and the Scheduling/Check-In application to support the new PAMS application.

The intent is to have the new PAMS application owned and supported by the ITSC by the end of October 2004. During the PAMS software development process, the IHS 3PB/AR TAG will play a key role in reviewing the software to ensure the existing functionality is included and that there is a smooth transition during the application's implementation. The ITSC is also working in conjunction with the National Business Office committee to plan for the review, deployment, and training of the PAMS application.

For more information on this project, please contact Sandra Lahi at 505-248-4206 or Adrian Lujan at 505-248-4349.

Sandra Lahi

Management & Program Analyst

IHS Patient Education

Patient Education in the Indian Health Service

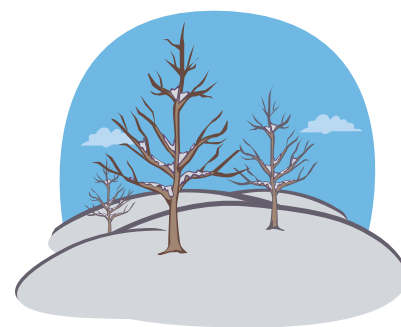
The old adage, “An ounce of prevention...” has taken on new meaning in the Indian Health Service Health Education program. Believing that education equals prevention, the IHS Health Education Program, in conjunction with many IHS programs and disciplines, has strived for the past several years to improve education and prevention efforts by educating Native American and Alaskan Native clients and healthcare providers on the importance of literacy and provider communication. Despite continuing to face many hurdles, the Indian Health Service has achieved a higher level of comprehensive integration of education, literacy, and provider communication into their systems than any other federal program or agency. The biggest thank you goes to the many healthcare providers across the IHS who agree that education does equal prevention and demonstrate a commitment to prevention by educating their patients and families.

We are continually improving our education efforts, and we can now measure this success thanks to the efforts of the IHS Indian Health Performance Evaluation System (IHPES) and the Information Technology Support Center (ITSC). Both programs have jointly provided a mechanism for tracking education.

The IHS Patient Education Protocols and Codes (PEP-C) are developed by a national committee of health care providers that meet annually to revise, create, and scrutinize codes, new edu-

cation protocols, and the corresponding codes for tracking the education that will be added to the IHS Standard Book of Codes. FY 2003 activities include:

- Integration of an education documenting and tracking/reporting component in the Behavioral Health/Mental Health, Diabetes, Public Health Nursing, CHR and the proposed new MCH software packages
- Integration of PEP-C into all PCC+ forms
- FY 2003 discussions with the dental, pharmacy, and laboratory programs will result in a mechanism for documenting and recording patient education in their software packages
- FY 2004 - Plans to integrate PEP-C into *all* software programs within IHS
- The PEP-C are already available in the Electronic Health Record
- Thanks to assistance from the Whiteriver Service Unit, the IHS will meet new JCAHO Educational Assessment requirements and will be able to track those statistics for JCAHO
- PEP-C developed a new In-Patient Educational Tracking form
- New FY 2003 PEP-C protocols include SARS, biological



weapons, metabolic syndrome, chronic kidney disease, Radiology/Nuclear Medicine, Laboratory, and advance directives.

- Thanks to ITSC, NIPRS, and ORYX disciplines within IHS are currently able to track their prevention/education efforts, tracking:
 - o Who - Which healthcare providers provided education
 - o What education was provided
 - o Where the education was provided
- GPRA Indicators will use education to track progress:
 - o Patient Education: Diet and Exercise
 - o Patient Education: Medications
 - o Patient Education: Prenatal HIV Testing and Education
 - o Domestic Violence Screening

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LOINC Project

The Map to LOINC Project

Introduction

Public health information systems are increasingly moving toward automated capture and analysis of data, use of data that are already electronic, and integration of public health and health care information systems. Laboratory data are becoming an increasingly valuable tool for public health agencies¹, for electronic laboratory-based reporting, and for public health surveillance.² However, code sets for laboratory test names may be different from one information system to another, complicating data aggregation. A solution is to map the local test names from these systems to an accepted standard, the Logical Observation Identifier Names and Codes (LOINC) code set.^{3,4}

A collaborative pilot project was undertaken by the Centers for Disease Control and Prevention (CDC) and Indian Health Service (IHS) to design and test a semi-automated process to standardize local laboratory test names to LOINC at five IHS medical facilities. IHS facilities use an integrated clinical and administrative information system, the Resource Patient Management System (RPMS). This system consists of more than 35 different applications. The Lab Package, which is used for laboratory records, is based on the Veterans Administration (VA) laboratory system (VISTA).

Objective

To develop a semi-automated process to standardize local laboratory test files by mapping to LOINC.

Methods

The laboratory test files (test names, synonyms, units, and specimens of the tests) from four of the five participating medical facilities were combined into one IHS master LOINC file. In addition, laboratory tests from file #60 distributed with the lab package version 5.2 and laboratory entries from a test system database were added to the IHS master LOINC file. Tests that were incomplete or contained incorrect information were marked as *uncodeable*. Panel tests were also excluded from the master file. Using the Regenstrief LOINC Mapping Assistant (RELMA), two scientists assigned LOINC codes to the 10,033 tests in the master file.

A mapping tool was developed for comparing each facility's laboratory test file to the IHS master LOINC file and automatically assigning a LOINC code to the test if a match was found in the master file. The mapping tool followed a two-step process. A LOINC code was assigned to the laboratory test if there was an exact match between the laboratory test name in the facility's laboratory test file and the master file. If no match was found during the first pass, all typographic characters (non-alpha numeric characters) were removed and the match-

ing process tried a second time. If a match was found during the second pass, a LOINC code was assigned; otherwise, no LOINC code was assigned to the test. Tests not assigned a code by the mapping tool were reviewed manually and codes were assigned.

The process was designed to accommodate future changes in laboratory test names/codes, to meet all data security and confidentiality standards, and to be easily expandable to other IHS medical facilities in future.

To integrate the mapping tool into RPMS, the following steps were taken (outlined in the Figure 1): the mapping tool, IHS master LOINC file, and the LOINC patch originally developed by the VA were combined to create the IHS lab patch (LR1015). The five pilot sites installed LR1015, and two additional RPMS patches, the APCD patch and the Generic Interface System (GIS) patch. These two additional patches are used for aggregating the data of interest, standardizing it into Health Level Seven (HL7) format, and exporting it to a server at the IHS headquarters. Monthly exports of the data (test names, LOINC codes, and test results) are performed at each of the five pilot sites.

Results

A total of 4,967 test names were in use at the five participating health

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RPMS Training Schedule (By Location)

December

Albuquerque Area

12/16-19 Intermediate Laboratory Package*

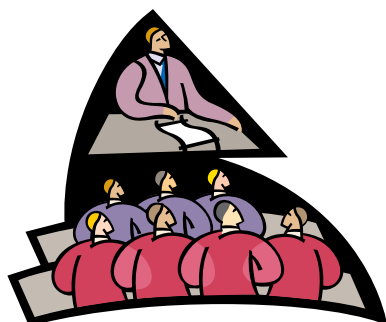
Nashville Area

12/01-04 PCC +*

Oklahoma Area

12/08-12 Third Party Billing/Accounts Receivable*

12/16-17 Patient Registration*



January

Albuquerque Area

01/27-29 Third Party Billing/Accounts Receivable

Nashville Area

01/12-16 PCC Data Entry I & II*

California Area

01/12-15 PCC+*

Navajo Area

01/27-29 PCC Output Reporting*

Oklahoma Area

01/13-14 Patient Registration (Choctaw)*

Phoenix Area

01/27-28 Behavioral Health System*

February

Albuquerque Area

02/19 Emergency Room Service*

02/23-26 PCC+*

Phoenix Area

02/03 GPRA+

02/04-05 Behavioral Health System (Tuscon)*

02/12-13 Immunization

02/24-26 Third Party Billing/Accounts Receivable (Elko)*

02/25-27 Diabetes Management

Portland Area

02/10-12 Third Party Billing/Accounts Receivable*

* ITSC-Sponsored

If the training you're interested in is ITSC-sponsored, please contact Michelle Riedel (505-248-4446 or Michelle.Riedel@ihs.gov) for more information. If the training is not ITSC-sponsored, you will need to contact the hosting Area's Training Coordinator.

Help Desk Statistics

The ITSC Help Desk closed 518 support calls between August 1 and October 31 of 2003. Here's a breakdown of those calls:

1. Open 0-7 Days: 320 (61.78%)
2. Open 8-14 Days: 57 (11.00%)
3. Open 15-21 Days: 37 (7.14%)
4. Open over 22 Days: 104 (20.08%)

You can contact the ITSC Help Desk by:

Phone: 888-830-7280 or 505-248-4371



Lucas Covington, *User Support Specialist*

modified the code and new variants soon appeared. The growth of the Internet and ease of communication have contributed greatly to the spread of new malicious programs. The number of known malicious programs is approximately 70,000, with many new programs being discovered daily.



How do malicious programs spread?

A worm, virus, or Trojan Horse can be spread through any means available to a computer system or user. The most common way to get a new virus or worm out into the Internet community is through social engineering (emails with provocative subject lines, etc). Once a malicious program has been executed on a system, it sets about performing the functions for which it was written, just like any other application or program. In the case of a worm, it will immediately attempt to spread itself to other vulnerable systems and start the process again. Infections of this type typically have an exponential growth rate initially and taper off as system administrators, anti-virus

vendors, and software manufacturers release protections and patches.

What can we do to protect our systems and data?

The single biggest weapon in the battle against malicious programs is education. It is important to recognize that malicious programs exist and that the people who write them do not give a second thought as to what may happen to your system or data.

Some simple steps to follow in order to reduce your vulnerability to malicious programs are:

- Install, use, and update anti-virus software. Most IHS systems should have anti-virus software already installed and updated automatically.
- Keep your system current with the latest patches from your software vendors.
- Use a firewall. IHS deploys firewalls on all Internet connections and installs software-based firewalls on laptops for remote users.
- Don't open email attachments from people that you do not know or that do not seem genuine. Email is the method of choice for most modern malicious programs.
- Don't install or run application

software from unknown sources. That new screensaver might just contain a virus.

- Report suspected infections to your IT support staff immediately.

IHS has deployed and maintains several different technologies in an effort to keep the impact of malicious programs to a minimum. New technologies that will aid us in maintaining current software across all IHS systems are also under investigation. Virus writers are always a step or two ahead of anti-virus vendors and software manufacturers. IHS IT support staff will remain reactionary in the fight against new malicious programs, but they need your support to prevent future outbreaks by following the simple steps above.

Scott Holm
DataCom, Security

Behavioral Health System

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- Shingle Springs Tribal Health Center

Friendship House, an urban residential alcohol and substance abuse treatment center in San Francisco will join the beta process at a later date. The second phase of beta will include testing of the new Group Entry functionality as well as modifications and enhancements that were made based on feedback received during the initial beta testing period. The BH GUI is expected to be released in December 2003.

The Future

The BH MIS work group, comprised of I/T/U mental health, alcohol/substance abuse, and social work subject matter experts, met in Albuquerque in November to review the development of the BH GUI and to refocus attention on the development of the long-term application. New requirements include the VHA Text Integration Utility (TIU) for clinical documentation, computerized provider order entry (CPOE) for medication, lab, radiology and dietetic orders, clinical decision support (CDS) or clinical guidelines, and inclusion of the VHA Mental Health Assistant (MHA) application. MHA is an application that allows the provider to administer stan-

dard psychological and behavioral health tests with a text-based or visual display of the results. Programming on the long-term application, Integrated Behavioral Health (IBH),



will begin in January. Discussions were also held regarding the inclusion of IBH as a component of the IHS Electronic Health Record (EHR), currently in development. Those BH programs located at sites not implementing the EHR will be able to continue to use BHS v3.0 or the BH GUI in Patient Chart. Additional information and updates can be found on the Integrated Behavioral Health (IBH) web pages on the IHS Internet site.

Denise Grenier
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Self Determination Services Team

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- to administer the ITSC components of Title I and III programs
- Evaluating Annual Funding Agreements
- Monitoring delivery of DIR/Tribal Technical Support services
- Marketing DIR and technical support options
- Providing Urban Indian Health programs support

What are our plans for the future?

- Developing a web interface so that after negotiations are finalized, the area negotiators can input information from DIR Worksheet #2
- Linking our web site to HQ, DFM, OTSG, and OTP databases
- Developing ITSC outreach media to promote competition with private industry for tribal support services
- 2005 pre-negotiation meetings and trainings – visiting each Area office to discuss IT changes with Area Lead Negotiators, Title I & V Coordinators, ISCs, tribal representatives, etc.

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Patient Education

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Education Encounters Tracked by IHS Areas comparing 2001 and 2003 (NIPRS and ORYX Data)

Area	2001	2003	Difference
Aberdeen Area	2,715	182,909	+ 180,194
Alaska Area	22,378	117,503	+ 95,125
Albuquerque Area	62,554	263,985	+ 201,431
Bemidji Area	29,623	134,236	+ 106,613
Billings Area	68,827	270,946	+ 202,119
California Area	15,979		
Nashville Area	33,034	233,124	+ 200,090
Navajo Area	167,509	720,403	+ 552,894
Oklahoma Area	359,649	1,742,705	+1,383,064
Phoenix Area	345,801	1,301,110	+ 955,309
Portland Area	50,143		
Tucson Area	18,704	64,828	+ 46,124
Total All IHS Areas	1,176,916	5,031,749	+3,854,833

- o Tobacco Use and Exposure to second hand smoke: Screening and Education
- o Cardiovascular disease and nutrition education

IHS Health Education Clients Served by Location

Fiscal Years 2001

Location	Number of Clients	Percent Distribution
Total Clients	696,060	100.0
Hospital	445,842	64.1
Health Center	225,617	32.4
Health Station	17,515	2.5
Location	6,339	0.9
Village Clinic	510	0.1
<i>(Locations for 1X-1Y)</i>		
School Health Center	189	0.0
Administration	35	0.0
Other	13	0.0

Members of the PEP-C: Mary Wachacha, HQE, Co-Chairs: Kelton Oliver, M.D. and Michale Ratzlaff, M.D., OKC; Michelle Ruslavage, RN, OKC; Sonya Vann, RN, OKC; Susan Dethman, RD, OKC; Cecelia Butler, RD, Albuquerque; Sandra Hahn, RN, Portland; Bonnie Smerud, Bemidji; Chris Lamer, Pharm.D, Nashville; and Linda Lucke, RN, Billings.

IHS Health Education Clients Served by Location

Fiscal Years 2002

Location	Number of Clients	Percent Distribution
Total Clients	812,301	100.0
Hospital	534,891	65.8
Health Center	253,526	31.2
Health Station	16,271	2.0
Location	6,719	0.8
Village Clinic	700	0.1
<i>(Locations for 1X-1Y)</i>		
School Health Center	157	0.0
Administration	37	0.0

Mary Wachacha
IHS Health Education

care facilities. Results of mapping to LOINC are presented by facility in Table 1. We were able to map 63% to 76% of the local active laboratory tests to LOINC using the mapping tool; 11% to 27% of the tests were mapped manually. We could not assign LOINC codes to 7% to 19% of the laboratory tests due to incomplete or incorrect information about these tests.

To validate the performance of our mapping tool, we tested it on a laboratory test file from a facility that did not participate in the pilot project. Of 703 laboratory tests in the facility's file, we were able to map 569 (81%) of the tests to LOINC.

Conclusions

- At each of the five participating facilities, we standardized approximately two-thirds or more of the laboratory test names to LOINC using the automated mapping process, approximating other similar efforts.⁵

- The results from the facility that did not participate in the tool development phase suggest that this semi-automated process will achieve comparable results if expanded to other IHS medical facilities.
- Improvement in quality of data will increase the percentage of tests mapped in future.
- Standardization of laboratory names will allow IHS to aggregate laboratory data more easily for disease surveillance and clinical and administrative reporting efforts.

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Table 1. Mapping Results

Site	Total Active Tests	Automated Mapping No. (%) [*]	Manual Mapping No. (%) [*]	Uncodeable Tests No. (%) [*]
1	1,050	800 (76)	111 (11)	139 (13)
2	1,098	687 (63)	204 (19)	207 (19)
3	1,315	872 (66)	360 (27)	83 (6)
4	1,213	765 (63)	244 (20)	204 (17)
5	291	205 (70)	36 (12)	50 (17)
Total	4,967	3,329 (67)	955 (19)	683 (14)

* Percentages do not add to 100% due to rounding

Thank You Letters

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1997/1998 funds. He thus saved IHS and our scholarship programs over \$1.4 mil in appropriated funds.

He was critical to the problem solving process. He accomplished all this with a positive attitude and a willingness to help, and contributed tremendously to the resolution.



ITSC Help Desk

The following is an excerpt from a letter from Theresa Perret, Site Manager of the Lummi Tribal Health center, thanking the ITSC Help Desk for their assistance:

I would like to thank... Morris Joe, Raymond Richardson, Edgar Morris, Lucas Covington, Rick Pullen, and Lori Butcher for their time and effort when Lummi Tribal Health Center had a data corruption in early June.

Each of these people helped with their own part of rebuilding the bad files and/or provided technical and help desk support, and were great to work with. Due to their hard work Lummi Tribal Health Center has been able to move forward and keep patient care the number 1 priority.

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